

12/6/16

"Ask not what your country can do for you, ask what you can do for your country."-John F. Kennedy

HW: "Long Division of Polynomials" #5, 7, 9, 11, 13

AIM: How do we do Polynomial Long Division?

Warm Up:

Divide 546 by 4 using long division.

$$\begin{array}{r}
 136 + \frac{2}{4} \\
 4 \overline{) 546} \\
 \underline{-4} \phantom{0} \phantom{0} \phantom{0} \\
 14 \phantom{0} \phantom{0} \phantom{0} \\
 \underline{-12} \phantom{0} \phantom{0} \\
 26 \phantom{0} \\
 \underline{24} \\
 2
 \end{array}$$

$$\frac{\text{Dividend}}{\text{Divisor}} = \text{Quotient} + \frac{\text{Remainder}}{\text{Divisor}}$$

Divide using long division.

$$-7m + 8m = 1m$$

1.  $(\underline{m^2 - 7m - 11}) \div (\underline{m - 8})$

$$\begin{array}{r} m + 1 + \frac{-3}{m-8} \\ m-8 \overline{) m^2 - 7m - 11} \\ \underline{-(m^2 - 8m)} \phantom{-11} \downarrow \\ 1m - 11 \\ \underline{-(m - 8)} \\ -3 \end{array}$$

$$\frac{m^2}{m} = m$$

$$m + 1 + \frac{-3}{m-8}$$

3.  $(n^2 + 10n + 18) \div (n + 5)$

$$n + 5 \overline{) n^2 + 10n + 18}$$

$n(n+5) \rightarrow \ominus (n^2 + 5n) \downarrow$

$5(n+5)$

$5n + 18$

$\ominus (5n + 25)$

$-7$

$\frac{n^2}{n} = n$

$\frac{5n}{n} = 5$

$n + 5 + \frac{-7}{n+5}$

6.  $(a^2 - 28) \div (a - 5)$

$$a-5 \overline{) a^2 + 0a - 28}$$

*(Note: The quotient is written as  $a + 5 + \frac{-3}{a-5}$  above the dividend.)*

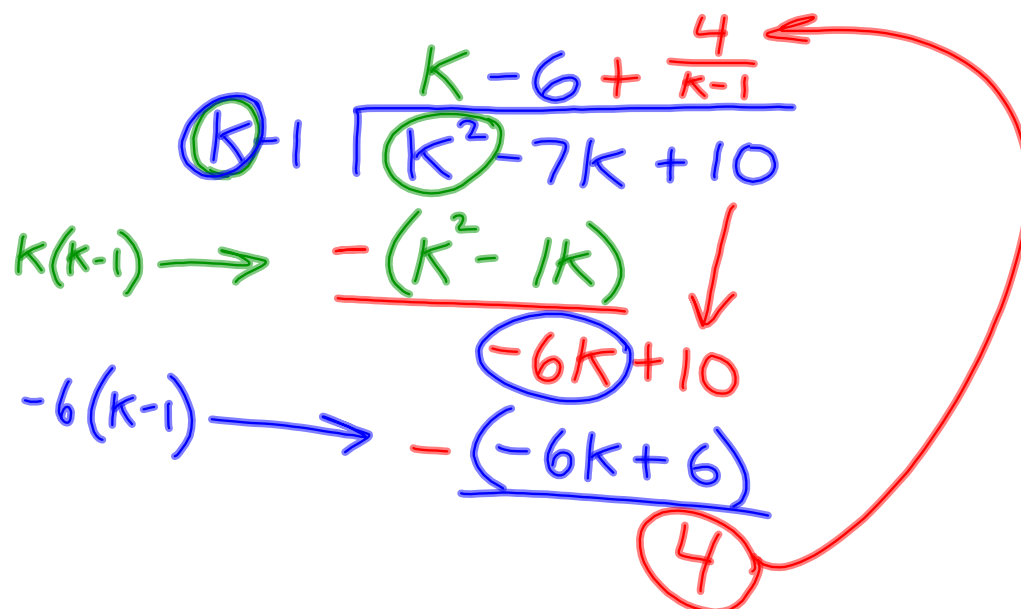
$$a(a-5) \rightarrow \underline{-(a^2 - 5a)}$$

$$5a - 28$$

$$5(a-5) \rightarrow \underline{-(5a - 25)}$$
$$\underline{\quad\quad\quad -3}$$

\* Be sure to include the 0 placeholders for any variable powers not seen in the dividend.

$$4) (k^2 - 7k + 10) \div (k - 1)$$

$$\begin{array}{r} k - 6 + \frac{4}{k-1} \\ \textcircled{k-1} \overline{) \textcircled{k^2} - 7k + 10} \\ \underline{k(k-1) \rightarrow -(k^2 - 1k)} \phantom{+ 10} \\ -6k + 10 \\ \underline{-6(k-1) \rightarrow -(-6k + 6)} \\ 4 \end{array}$$


$$4 \overline{)13}$$

$$4 \overline{)103}$$

1 hundred  
0 tens  
3 ones

9.  $(2x^2 - 17x - 38) \div (2x + 3)$

16.  $(40x - 13x^2 + x^3 + 18) \div (x - 7)$

$$\begin{array}{r}
 x-7 \overline{) x^3 - 13x^2 + 40x + 18} \\
 \underline{x^2(x-7) + (-x^3 + 7x^2)} \phantom{+ 18} \\
 -6x^2 + 40x \phantom{+ 18} \\
 \underline{-6x(x-7)} \phantom{+ 18} \\
 -2x + 18 \\
 \underline{-2(x-7)} \\
 4
 \end{array}$$

\* When we set up, be sure to write the dividend and divisor in decreasing order of powers (highest exponent to lowest)



$$\begin{array}{r} 4 \overline{) 852} \\ 4 \overline{) 582} \end{array}$$

5 - hundreds

8 - tens

2 - ones

$$20) (10k^2 - 35k + 50k^3 - 7) \div (-4 + 5k)$$

$$5k - 4 \overline{) 50k^3 + 10k^2 - 35k - 7}$$

HW: 12, 14, 18, 20